

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-219440

(43)Date of publication of application : 10.08.1999

(51)Int.Cl.

G06T 11/60

G03F 1/00

G06T 11/80

G06T 3/40

(21)Application number : 10-021945

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(22)Date of filing : 03.02.1998

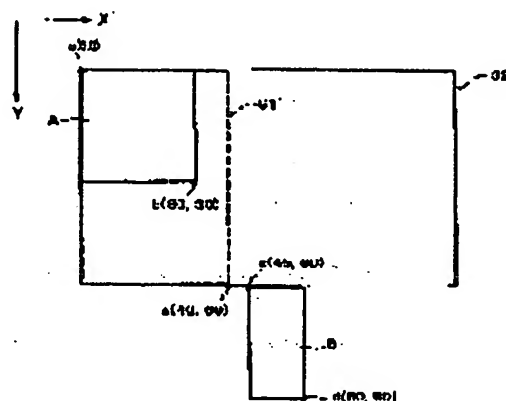
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(54) IMAGE EDITING DEVICE, IMAGE EDITING METHOD AND RECORDING MEDIUM
RECORDING IMAGE EDITING PROCESSING PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent an image from swelling out from an image edition area due to a change in the or aspect ratio of the image edition area.

SOLUTION: When an image edition area S1 is changed by changing the size of printing paper and an image B swells out from a changed image edition area S2, the reduction ratio of the unchanged image edition area S1 is calculated so that the area S1 is included in the area S2, the sizes of both images A, B are reduced based on the reduction ratio and the positions of both the images A, B are changed. Consequently the images A, B can be arranged in the area S2 in a state maintaining the arrangement relation of both the images A, B.



LEGAL STATUS

[Date of request for examination]

07.08.2002

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's

decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] It is image edit equipment into which two or more images arranged to the image edit field formed on the store circuit are edited. A field modification means to change said image edit field by changing either or both sides among the dip of said image edit field, and breadth, A judgment means to judge whether there is any image protruded from the image edit field after modification by said field modification means among said two or more images, When there is said overflowing image based on the judgment result of said judgment means Image edit equipment equipped with a contraction means to reduce the magnitude of two or more of said images, and the distance between each image so that it might be in the condition which maintained the arrangement relation of two or more of said images and said overflowing image might be restored to the image edit field after said modification.

[Claim 2] Said contraction means is in the condition which maintained an operation means to calculate the reduction percentage which reduces the image edit field before said modification so that the image edit field before modification by said field modification means may be restored to the image edit field after said modification, and the arrangement relation of two or more of said images. And image edit equipment [equipped with an image contraction means to reduce the magnitude of two or more of said images, and the distance between each image with the reduction percentage calculated with said operation means] according to claim 1.

[Claim 3] A comparison means by which said operation means compares the aspect ratio of the image edit field before said modification with the aspect ratio of the image edit field after said modification, Based on the comparison result of said comparison means, the ratio of the breadth to the dip in the image edit field after said modification When it increases from the ratio of the breadth to the dip in the image edit field before said modification The reduction percentage which reduces the image edit field before said modification so that the dip of the image edit field before said modification may become equal to the dip of the image edit field after said modification is computed. Based on the comparison result of said comparison means, the ratio of the breadth to the dip in the image edit field after said modification When it decreases rather than the ratio of the breadth to the dip in the image edit field before said modification Image edit equipment [equipped with a reduction percentage calculation means to compute the reduction percentage which reduces the image edit field before said modification so that the breadth of the image edit field before said modification may become equal to the breadth of the image edit field after said modification] according to claim 2.

[Claim 4] Said image contraction means is image edit equipment according to claim 2 or 3 which is what carries out the multiplication of the reduction percentage calculated with said operation means to each position coordinate of each magnitude of two or more of said images, and two or more images concerned.

[Claim 5] It is the image edit approach of editing two or more images arranged to the image edit field formed on the store circuit. The field modification procedure which changes said image edit field by changing either or both sides among the dip of said image edit field, and breadth, The judgment procedure of judging whether there being any image protruded from the image edit field after modification by said field modification procedure among said two or more images, When

there is said overflowing image based on the judgment result of said judgment procedure The image edit approach equipped with the contraction procedure which reduces the magnitude of two or more of said images, and the distance between each image so that it might be in the condition which maintained the arrangement relation of two or more of said images and said overflowing image might be restored to the image edit field after said modification.

[Claim 6] Said contraction procedure is in the condition which maintained the operation procedure of calculating the reduction percentage which reduces the image edit field before said modification so that the image edit field before modification by said field modification procedure may be restored to the image edit field after said modification, and the arrangement relation of two or more of said images. And the image edit approach [equipped with the image contraction procedure which reduces the magnitude of two or more of said images, and the distance between each image with the reduction percentage calculated with said operation procedure] according to claim 5.

[Claim 7] The comparison procedure in which said operation procedure compares the aspect ratio of the image edit field before said modification with the aspect ratio of the image edit field after said modification, Based on the comparison result of said comparison procedure, the ratio of the breadth to the dip in the image edit field after said modification When it increases from the ratio of the breadth to the dip in the image edit field before said modification The reduction percentage which reduces the image edit field before said modification so that the dip of the image edit field before said modification may become equal to the dip of the image edit field after said modification is computed. Based on the comparison result of said comparison procedure, the ratio of the breadth to the dip in the image edit field after said modification When it decreases rather than the ratio of the breadth to the dip in the image edit field before said modification The image edit approach [equipped with the reduction percentage calculation procedure which computes the reduction percentage which reduces the image edit field before said modification so that the breadth of the image edit field before said modification may become equal to the breadth of the image edit field after said modification] according to claim 6.

[Claim 8] Said image contraction procedure is the image edit approach according to claim 6 or 7 which is what carries out the multiplication of the reduction percentage calculated with said operation procedure to each position coordinate of each magnitude of two or more of said images, and two or more images concerned.

[Claim 9] It is the record medium which recorded the image edit processing program which edits two or more images arranged by computer to the image edit field formed on the store circuit. The field modification procedure which changes said image edit field by changing either or both sides among the dip of said image edit field, and breadth, The judgment procedure of judging whether there being any image protruded from the image edit field after modification by said field modification procedure among said two or more images, When there is said overflowing image based on the judgment result of said judgment procedure The record medium which recorded the image edit processing program equipped with the contraction procedure which reduces the magnitude of two or more of said images, and the distance between each image so that it might be in the condition which maintained the arrangement relation of two or more of said images and said overflowing image might be restored to the image edit field after said modification.

[Claim 10] Said contraction procedure is in the condition which maintained the operation procedure of calculating the reduction percentage which reduces the image edit field before said modification so that the image edit field before modification by said field modification procedure may be restored to the image edit field after said modification, and the arrangement relation of two or more of said images. And the record medium which recorded the image edit processing program [equipped with the image contraction procedure which reduces the magnitude of two or more of said images, and the distance between each image with the reduction percentage calculated with said operation procedure] according to claim 9.

[Claim 11] The comparison procedure in which said operation procedure compares the aspect ratio of the image edit field before said modification with the aspect ratio of the image edit field after said modification, Based on the comparison result of said comparison procedure, the ratio of the breadth to the dip in the image edit field after said modification When it increases from

the ratio of the breadth to the dip in the image edit field before said modification The reduction percentage which reduces the image edit field before said modification so that the dip of the image edit field before said modification may become equal to the dip of the image edit field after said modification is computed. Based on the comparison result of said comparison procedure, the ratio of the breadth to the dip in the image edit field after said modification When it decreases rather than the ratio of the breadth to the dip in the image edit field before said modification The record medium which recorded the image edit processing program [equipped with the reduction percentage calculation procedure which computes the reduction percentage which reduces the image edit field before said modification so that the breadth of the image edit field before said modification may become equal to the breadth of the image edit field after said modification] according to claim 10.

[Claim 12] Said image contraction procedure is the record medium which recorded the image edit processing program according to claim 10 or 11 which is what carries out the multiplication of the reduction percentage calculated with said operation procedure to each position coordinate of each magnitude of two or more of said images, and two or more images concerned.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is used for for example, a DTP system, a printer system, a word processor, etc., and relates to the image edit equipment and the image edit approach for editing an image on a computer.

[0002]

[Description of the Prior Art] When creating printed matter, such as a catalog, a throwaway, a magazine, and a newspaper, it is necessary to set up the layout of two or more images arranged on a form. Such an activity is usually done using the DTP system which used computers, such as a personal computer and a workstation.

[0003] For example, the image edit field corresponding to the size of the form to print is set up on the store circuit of a computer, and this image edit field is displayed on a display. And an operator sticks an image (image data) on the location of a request of this image edit field, looking at a display. Furthermore, it is made to move, or an image is made to expand and reduce and the layout of an image is set up so that the stuck image may not be lapped.

[0004]

[Problem(s) to be Solved by the Invention] By the way, as mentioned above, the image edit field magnitude displayed on the display is equivalent to the size of the form to print. That is, the die length of the lengthwise direction of the image edit field displayed on the display is equivalent to the dimension of the dip of a print sheet, and the die length of the longitudinal direction of the image edit field displayed on the display is equivalent to the dimension of the breadth of a print sheet. Therefore, when the size of a print sheet is changed, the image edit area size displayed on the display is also changed.

[0005] Consequently, if the size of a print sheet is changed after already sticking an image on an image edit field, the image edit field where image edit area size was changed and the stuck image was changed may be overflowed. When the size of a print sheet is changed into size smaller than before after already sticking an image on an image edit field, or when the ratio (this is hereafter called "aspect ratio") of the dip dimension of a print sheet and a breadth dimension is changed, specifically, the stuck image may overflow an image edit field.

[0006] Thus, when an image overflows an image edit field, it is necessary to restick the overflowing image once again, and there is a problem that the workability of an image editing task is bad. When the size of a print sheet is changed and an image overflows an image edit field, after a layout setup of an image was completed especially, in order to rearrange the overflowing image to an image edit field, there is a case where it must stop having to redo a layout setup on the whole, and an image editing task will take great time amount.

[0007] By having been made in view of a problem which was mentioned above, and having changed image edit area size or an aspect ratio, this invention can prevent that an image overflows an image edit field, and aims at offering the image edit equipment and the image edit approach of raising the workability of an image editing task.

[0008]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem,

invention of claim 1 It is image edit equipment into which two or more images arranged to the image edit field formed on the store circuit are edited. A field modification means to change an image edit field by changing either or both sides among the dip of an image edit field, and breadth, A judgment means to judge whether there is any image protruded from the image edit field after modification by the field modification means among two or more images, When there is an image protruded based on the judgment result of a judgment means, it has a contraction means to reduce the magnitude of two or more images, and the distance between each image so that it may be in the condition which maintained the arrangement relation of two or more images and may be restored to the image edit field after the overflowing image changing.

[0009] For example, when you are in the condition that two or more images are arranged in the image edit field, suppose that the image edit field was changed with the field modification means so that one side or the both sides of the dip of an image edit field and breadth might become small. By this, one of the images settled in the image edit field for example, before modification presupposes that the image edit field after modification was overflowed. In such a case, it judges that a judgment means has an image overflowing from the image edit field after modification. And a contraction means reduces the magnitude of each image, and the distance between each image so that it may be in the condition which maintained the arrangement relation of each image arranged to the image edit field before modification and may be restored to the image edit field after the overflowing image changing.

[0010] For example, the field which surrounds from an outside all the images arranged to the image edit field before modification can be made to reduce on the whole by reducing the magnitude of each image, and the distance between each image by the respectively same ratio. It can dedicate to the image edit field after changing the image which the field which surrounds from an outside all the images arranged to the image edit field before modification at this time protruded where the arrangement relation of each image arranged to the image edit field before modification is maintained, when setting up the ratio of contraction so that it might be restored to the image edit field after modification.

[0011] It not only can prevent by this that an image overflows an image edit field, but [when image edit area size is changed,] when image edit area size is changed, it can prevent that the arrangement relation of two or more images arranged to the image edit field collapses.

[0012] The contraction means in the image edit equipment by invention of claim 2 Where an operation means to calculate the reduction percentage which reduces the image edit field before modification so that it may be restored to the image edit field after the image edit field before modification by the field modification means changing, and the arrangement relation of two or more images are maintained And it has an image contraction means to reduce the magnitude of two or more images, and the distance between each image with the reduction percentage calculated with the operation means.

[0013] That is, it asks for the reduction percentage which reduces the image edit field before modification by the operation so that it may be restored to the image edit field after the image edit field before modification changing, and the magnitude of two or more images and the distance between each image are reduced with this reduction percentage. Thereby, on the whole, it can reduce the whole image edit field before modification, and all the images arranged to the image edit field before modification can be dedicated to the image edit field after modification.

[0014] The operation means in the image edit equipment by invention of claim 3 A comparison means to compare the aspect ratio of the image edit field before modification with the aspect ratio of the image edit field after modification, When the ratio of the breadth to the dip in the image edit field after modification increases from the ratio of the breadth to the dip in the image edit field before modification based on the comparison result of a comparison means The reduction percentage which reduces the image edit field before modification so that it may become equal to the dip of the image edit field after the dip of the image edit field before modification changing is computed. When the ratio of the breadth to the dip in the image edit field after modification decreases based on the comparison result of a comparison means rather than the ratio of the breadth to the dip in the image edit field before modification It has a reduction percentage calculation means to compute the reduction percentage which reduces the

image edit field before modification so that it may become equal to the breadth of the image edit field after the breadth of the image edit field before modification changing.

[0015] That is, if an image edit field is changed so that the appearance may become comparatively oblong, the ratio of the breadth to the dip in the image edit field after modification will increase from the ratio of the breadth to the dip in the image edit field before modification. When such, the reduction percentage which reduces the image edit field before modification so that it may become equal to the dip of the image edit field after the dip of the image edit field before modification changing is computed.

[0016] On the other hand, if an image edit field is changed so that the appearance may become comparatively longwise, the ratio of the breadth to the dip in the image edit field after modification will decrease rather than the ratio of the breadth to the dip in the image edit field before modification. When such, the reduction percentage which reduces the image edit field before modification so that it may become equal to the breadth of the image edit field after the breadth of the image edit field before modification changing is computed.

[0017] It not only can dedicate by this all the images arranged in the image edit field before modification to the image edit field after modification, but [where those arrangement relation is maintained,] it can dedicate all the images arranged in the image edit field before modification to the image edit field after modification in the condition of having reduced with the minimum reduction percentage.

[0018] The image contraction means in the image edit equipment by invention of claim 4 carries out the multiplication of the reduction percentage calculated with the operation means to each position coordinate of each magnitude of two or more images, and two or more images concerned.

[0019] Thereby, by the easy operation, all the images arranged in the image edit field before modification can be dedicated to the image edit field after modification, where those arrangement relation is maintained.

[0020] Invention of claim 5 is the image edit approach of editing two or more images arranged to the image edit field formed on the store circuit. The field modification procedure which changes an image edit field by changing either or both sides among the dip of an image edit field, and breadth, The judgment procedure of judging whether there being any image protruded from the image edit field after modification by the field modification procedure among two or more images, When there is an image protruded based on the judgment result of a judgment procedure, it has the contraction procedure which reduces the magnitude of two or more images, and the distance between each image so that it may be in the condition which maintained the arrangement relation of two or more images and may be restored to the image edit field after the overflowing image changing.

[0021] Thereby, like invention of claim 1, when image edit area size is changed, while being able to prevent that an image overflows an image edit field, when image edit area size is changed, it can prevent that the arrangement relation of two or more images arranged to the image edit field collapses.

[0022] The contraction procedure in the image edit approach by invention of claim 6 Where the operation procedure of calculating the reduction percentage which reduces the image edit field before modification so that it may be restored to the image edit field after the image edit field before modification by the field modification procedure changing, and the arrangement relation of two or more images are maintained And it has the image contraction procedure which reduces the magnitude of two or more images, and the distance between each image with the reduction percentage calculated with the operation procedure.

[0023] Thereby, like invention of claim 2, on the whole, it can reduce the whole image edit field before modification, and the image arranged to the image edit field before modification can be dedicated to the image edit field after modification.

[0024] The operation procedure in the image edit approach of invention of claim 7 The comparison procedure which compares the aspect ratio of the image edit field before modification with the aspect ratio of the image edit field after modification, When the ratio of the breadth to the dip in the image edit field after modification increases from the ratio of the

breadth to the dip in the image edit field before modification based on the comparison result of a comparison procedure. The reduction percentage which reduces the image edit field before modification so that it may become equal to the dip of the image edit field after the dip of the image edit field before modification changing is computed. When the ratio of the breadth to the dip in the image edit field after modification decreases based on the comparison result of a comparison procedure rather than the ratio of the breadth to the dip in the image edit field before modification, it has the reduction percentage calculation procedure which computes the reduction percentage which reduces the image edit field before modification so that it may become equal to the breadth of the image edit field after the breadth of the image edit field before modification changing.

[0025] Thereby, all the images arranged in the image edit field before modification can be dedicated to the image edit field after modification in the condition of having reduced with the minimum reduction percentage, like invention of claim 3.

[0026] The image contraction procedure in the image edit approach by invention of claim 8 carries out the multiplication of the reduction percentage calculated with the operation procedure to each position coordinate of each magnitude of two or more images, and two or more images concerned.

[0027] Thereby, like invention of claim 4, by the easy operation, all the images arranged in the image edit field before modification can be dedicated to the image edit field after modification, where those arrangement relation is maintained.

[0028] Moreover, if the image edit processing program by invention of claim 9 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 1.

[0029] Moreover, if the image edit processing program by invention of claim 10 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 2.

[0030] Moreover, if the image edit processing program by invention of claim 11 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 3.

[0031] Moreover, if the image edit processing program by invention of claim 12 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 4.

[0032]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained according to an accompanying drawing.

[0033] As equipment which applied the image edit equipment and the image edit approach by this invention, a DTP system is mentioned as an example and this operation gestalt explains it.

[0034] Drawing 1 shows the whole DTP system 10 configuration by this operation gestalt. As shown in drawing 1, the DTP system 10 is equipped with CPU11, ROM12, RAM13, a display 14, the keyboard 15, the mouse 16, the hard disk 17, and the printer 18 grade.

[0035] CPU11 controls the DTP system 10 whole. Moreover, CPU11 performs the image edit processing program shown in drawing 2 so that it may mention later.

[0036] The program for controlling the DTP system 10 whole, the image edit processing program shown in drawing 2, other various data, etc. are memorized by ROM12. RAM13 is used as a working area, when CPU11 performs image edit processing etc. Furthermore, the below-mentioned image edit field S is formed in RAM13.

[0037] The display 14 consists of a CRT display or a liquid crystal display. The image edit field S is displayed on this display 14. Moreover, the image data used for image edit is memorized by the hard disk 17. Furthermore, a printer 18 prints the image edit field S on a print sheet with the image arranged to the image edit field S concerned. That is, a printer 18 prints each image arranged to the image edit field S, with mutual arrangement relation maintained.

[0038] Here, the image edit field S formed in RAM13 of the DTP system 10 is explained. The image edit field S is a field for editing an image, as shown in drawing 3. This image edit field S is X-Y coordinate flat surface, the X coordinate value of the image edit field S increases, so that

the upper left top-most vertices of the image edit field S are zeros (0 0) and it goes for the right-hand side in drawing 3 into drawing 3, and the Y coordinate value of the image edit field S increases it, so that it goes to the bottom in drawing 3. Moreover, the magnitude of the image edit field S is set up so that it may correspond to the size of a print sheet. Therefore, if the size of a print sheet is changed, this will be interlocked with and the magnitude of the image edit field S will be changed.

[0039] When performing image edit processing in this image edit field S, CPU11 recognizes at least the coordinate of two points which faces each other on the diagonal line of the image arranged to the image edit field S, and CPU11 can find the location of an image, magnitude, a location, the length of each side, etc. by the operation if needed based on this.

[0040] Moreover, the appearance of the image arranged to the image edit field S is a rectangle. When creating printed matter, such as a catalog, a throwaway, a magazine, and a newspaper, since the appearance of the image arranged on a print sheet is a rectangle, it is usually premised on an appearance editing a rectangular image in the DTP system 10 by this operation gestalt. In addition, in the DTP system 10 by this operation gestalt, it is also possible to edit the image which has configurations other than a rectangle. In this case, supposing the frame of the rectangle surrounding that image, the frame and image of this rectangle are made to unify and it is dealt with. Thereby, even if it is the image which has configurations other than a rectangle, it can edit like a rectangle image.

[0041] Thus, when the constituted DTP system 10 performs image edit, an operator sets up the magnitude of the image edit field S which performs image edit by setting up the size of a print sheet. And an operator calls the image data memorized by the hard disk 17, and sticks on the image edit field S which operated the keyboard 15 and the mouse 16 and was displayed [mouse] on the display 14 in this image data. Furthermore, an operator can move the image (image data) stuck on the image edit field S by operating a mouse 16. Moreover, an image can be moved also by inputting the coordinate in the image edit field S using a keyboard 15. Moreover, since the magnitude of the image edit field S displayed on the display 14 is set up so that it may correspond to the size of a print sheet, an operator can perform image editing tasks, such as a layout setup of an image, with the feeling same with sticking an actual picture and an actual photograph on a form. And each image displayed on the display 14 can be printed on a print sheet as it is by the printer 18.

[0042] Next, the image edit processing program shown in drawing 2 is explained. This image edit processing program performs prevention processing which dedicates that overflowing image in the image edit field S after modification and to protrude, when the magnitude of the image edit field S is changed and an image overflows the image edit field S after modification.

[0043] If a power source is supplied to the DTP system 10, the program shown in drawing 2 will be started. First, at step 21, it judges whether the image edit field S was changed. That is, the image edit field S is changed by changing the size of a print sheet. If it explains concretely, an operator can change the size of a print sheet by operating a keyboard 15. For example, an operator can change the size of a print sheet choosing the print sheet size standardized [B4 / A1 A4,] or by inputting the dip dimension and breadth dimension of a print sheet. And when the image edit field S is changed by having changed the size of a print sheet as a result of the judgment of step 21, it shifts to step 22.

[0044] At step 22, it judges whether there is any image overflowing into the image edit field S after modification. For example, as shown in drawing 3, when Image A and Image B are already arranged and the image edit field S1 is changed into the image edit field S1 before modification like the image edit field S2, as shown in drawing 4, Image B may overflow the image edit field S2 after modification. In such a case, it is judged with "YES" at this step 22, and shifts to step 23. On the other hand, when there is no image overflowing from the image edit field S2 after modification, it returns to step 21.

[0045] Here, it can be judged by the operation by comparing the magnitude of the image edit field S2 after modification with the location of each image in the image edit field S1 before modification whether there is any image overflowing into the image edit field S2 after modification. Moreover, the magnitude of the image edit field S2 after modification can be

recognized by investigating the coordinate of the top-most vertices of the image edit field S2 after modification, and the location of each image in the image edit field S1 before modification can be recognized by investigating the coordinate of the top-most vertices of each image.

[0046] Now, at step 23, it judges whether it became larger than the aspect ratio of the image edit field S1 before the aspect ratio of the image edit field S2 after modification changing. Here, the aspect ratio of the image edit field S means a ratio to the breadth to the dip of the image edit field S. That is, the aspect ratios of the image edit field S are breadth/dip. Therefore, if the appearance of the image edit field S changes comparatively oblong as shown in drawing 7, the aspect ratio of the image edit field S will become large. On the other hand, if the appearance of the image edit field S changes comparatively longwise as shown in drawing 8, the aspect ratio of the image edit field S will become small.

[0047] And based on the judgment result of step 23, when it becomes larger than the aspect ratio of the image edit field S1 before the aspect ratio of the image edit field S2 after modification changing, it shifts to step 24.

[0048] At step 24, as shown in drawing 7, it asks for the reduction percentage for making the image edit field S1 before modification reduce by the operation so that it may be restored to the image edit field S2 after the image edit field S1 before modification changing. Specifically, it asks for reduction percentage by breaking the dip of the image edit field S2 after modification by the dip of the image edit field S1 before modification.

[0049] On the other hand, when it becomes smaller than the aspect ratio of the image edit field S before the aspect ratio of the image edit field S after modification changing based on the judgment result of step 23, it shifts to step 25 from step 23.

[0050] At step 25, as shown in drawing 8, it asks for the reduction percentage for making the image edit field S1 before modification reduce by the operation so that it may be restored to the image edit field S2 after the image edit field S1 before modification changing. Specifically, it asks for reduction percentage by breaking the breadth of the image edit field S2 after modification by breadth of the image edit field S1 before modification.

[0051] At step 26, the multiplication of the reduction percentage for which it asked at step 24 or step 25 is carried out to the value which shows the magnitude and the location of each image which have been arranged to the image edit field S1 before modification. Thereby, magnitude is reduced to an image and the location of an image is changed. When the top-most-vertices coordinate of an image has determined the location of an image, it is carrying out the multiplication of said reduction percentage to the top-most-vertices coordinate of an image, and, specifically, the location of an image is changed. Thus, if the location and magnitude of each image are changed based on the same reduction percentage, it can arrange to the image edit field S2 after changing each image, with the mutual arrangement relation of each image maintained.

[0052] Next, the flash prevention processing mentioned above is concretely explained using drawing 3 thru/or drawing 6.

[0053] As shown in drawing 3, Image A and Image B are arranged to the image edit field S1 of the magnitude of breadth 60 and a dip 90. Image A is arranged in the magnitude of a dip 30 and breadth 30 in the location of a coordinate (0 0) (the coordinate of the upper left top-most vertices of an image shall show the location of an image). On the other hand, Image B is arranged in the magnitude of a dip 15 and breadth 30 in the location of a coordinate (45 60).

[0054] As a result of changing the image edit field S1 into the image edit field S2 as shown in drawing 4 in such the condition, Image B has overflowed the image edit field S2 after modification.

[0055] In such a case, it is judged by flash prevention processing mentioned above that Image B has overflowed. When such a judgment result is obtained, as shown in drawing 5, it asks for reduction percentage which is restored to the image edit field S2 after modification in the image edit field S1 before modification, and the magnitude of Image A and Image B is reduced with this reduction percentage, and both location is changed where both arrangement relation is maintained. That is, it is judged whether it became larger than the aspect ratio of the image edit field S1 before the aspect ratio of the image edit field S2 after modification changing first. In this

case, the aspect ratio of the image edit field S1 before modification is 2/3, and the aspect ratio of the image edit field S2 after modification is 3/2. Therefore, it asks for reduction percentage by breaking the dip of the image edit field S2 after modification by the dip of the image edit field S1 before modification. Since the dip of the image edit field S2 after modification is 60 and the dip of the image edit field S1 before modification is 90 as shown in drawing 3 and drawing 5, reduction percentage is 2/3.

[0056] Furthermore, the magnitude and the location of Image A and Image B are changed using this reduction percentage. That is, if Image A is reduced to two thirds of magnitude, Image A will become the magnitude of breadth 20 and a dip 20. In addition, since the location of Image A is a coordinate (0 0), even if it carries out the multiplication of two thirds to these coordinate values, it does not change. Therefore, Image A serves as magnitude as shown in drawing 6, and the location does not change. Moreover, if Image B is reduced to two thirds of magnitude, Image B serves as magnitude of breadth 10 and breadth 20, and the location will carry out the multiplication of two thirds to each coordinate of the coordinate before modification (45 60), and will serve as a coordinate (30 40). Therefore, the magnitude and the location of Image B come to be shown in drawing 6, and Image B is completely settled in the image edit field S2 after modification. Moreover, even if the image edit field S is changed so that it may turn out that drawing 3 is compared with drawing 6, the arrangement relation between Image A and Image B is not changing. Furthermore, in the image edit field S2 after modification, as shown in drawing 6, after the image edit field S1 before modification has contracted on the whole, it is settled. The image edit field S1 before modification is in the condition reduced with the minimum reduction percentage, in other words, is the greatest magnitude and is dedicated in the image edit field S2 after modification further again. Therefore, Image A and Image B are in the condition which maintained mutual arrangement relation, and it is arranged in the image edit field S2 after modification in the greatest magnitude.

[0057] In this way, according to the DTP system 10 by this operation gestalt, where the arrangement relation of each image arranged to the image edit field S1 before modification is maintained, it can dedicate to the image edit field S2 after changing the overflowing image. It not only can prevent by this that an image overflows the image edit field S, but [when the magnitude of the image edit field S is changed,] when the magnitude of the image edit field S is changed, it can prevent that the arrangement relation of two or more images arranged to the image edit field S collapses.

[0058] Therefore, even if an operator changes the magnitude of the image edit field S after a layout (arrangement) setup of an image, since the layout of an image is maintained, it does not need to redo a layout setup. Therefore, the workability of an image editing task can be raised.

[0059] Moreover, according to this operation gestalt, as shown in drawing 6, all the images arranged in the image edit field S1 before modification can be dedicated to the image edit field after modification in the condition of having reduced with the minimum reduction percentage. Therefore, it can prevent that become small, and the image arranged to the image edit field S1 before modification sees, and becomes hot by having changed the image edit field S.

[0060] In addition, although the case where the image edit field S was changed according to modification of the size of a print sheet was mentioned as the example and said operation gestalt explained it, the image edit field S is changed with the sense of a print sheet etc.

Moreover, you may make it change the image edit field S regardless of the size of a print sheet.

[0061] Furthermore, with said operation gestalt, although the DTP system was mentioned as the example as image edit equipment of this invention, this invention is applicable not only to this but a printer system, a word processor, etc. Moreover, this invention may be used for the configuration control of the image displayed on the display of not only when using for an image layout setup for creating printed matter, but a viewer etc.

[0062]

[Effect of the Invention] A field modification means to change an image edit field by changing either or both sides among the dip of an image edit field, and breadth according to the image edit territory of invention of claim 1 as explained in full detail above, A judgment means to judge whether there is any image protruded from the image edit field after modification by the field

modification means among two or more images, When there is an image protruded based on the judgment result of a judgment means So that it may be in the condition which maintained the arrangement relation of two or more images and may be restored to the image edit field after the overflowing image changing Since it considered as the configuration equipped with a contraction means to reduce the magnitude of two or more images, and the distance between each image, even if an operator changes image edit area size after a layout (arrangement) setup of an image, since the layout of an image is maintained, it does not need to redo a layout setup. Therefore, the workability of an image editing task can be raised.

[0063] An operation means to calculate the reduction percentage which reduces the image edit field before modification so that it may be restored to the image edit field after the image edit field before modification by the field modification means changing in a contraction means according to the image edit equipment of invention of claim 2, Since it considered as the configuration equipped with an image contraction means to reduce the magnitude of two or more images, and the distance between each image with the reduction percentage which is in the condition which maintained the arrangement relation of two or more images, and was calculated with the operation means On the whole, it can reduce the whole image edit field before modification, and all the images arranged to the image edit field before modification can be dedicated to the image edit field after modification.

[0064] According to the image edit equipment of invention of claim 3, it sets for an operation means. The aspect ratio of the image edit field before modification, Based on the comparison result of a comparison means to compare the aspect ratio of the image edit field after modification, and a comparison means, the ratio of the breadth to the dip in the image edit field after modification When it increases from the ratio of the breadth to the dip in the image edit field before modification The reduction percentage which reduces the image edit field before modification so that it may become equal to the dip of the image edit field after the dip of the image edit field before modification changing is computed. When the ratio of the breadth to the dip in the image edit field after modification decreases based on the comparison result of a comparison means rather than the ratio of the breadth to the dip in the image edit field before modification Since it considered as the configuration equipped with a reduction percentage calculation means to compute the reduction percentage which reduces the image edit field before modification so that it might become equal to the breadth of the image edit field after the breadth of the image edit field before modification changing All the images arranged in the image edit field before modification can be dedicated to the image edit field after modification in the condition of having reduced with the minimum reduction percentage. Therefore, it can prevent that become small, and the image arranged to the image edit field before modification sees, and becomes hot by having changed the image edit field.

[0065] Since the multiplication of the reduction percentage calculated with the operation means to each position coordinate of each magnitude of two or more images and two or more images concerned is carried out, according to the image edit equipment of invention of claim 4, in an image contraction means, all the images arranged in the image edit field before modification can dedicate to the image edit field after modification by the easy operation, where those arrangement relation is maintained.

[0066] The field modification procedure which changes an image edit field by changing either or both sides among the dip of an image edit field, and breadth according to the image edit approach of invention of claim 5, The judgment procedure of judging whether there being any image protruded from the image edit field after modification by the field modification procedure among two or more images, When there is an image protruded based on the judgment result of a judgment procedure So that it may be in the condition which maintained the arrangement relation of two or more images and may be restored to the image edit field after the overflowing image changing While being able to prevent that an image overflows an image edit field like invention of claim 1 when image edit area size is changed since it had the contraction procedure which reduces the magnitude of two or more images, and the distance between each image When image edit area size is changed, it can prevent that the arrangement relation of two or more images arranged to the image edit field collapses.

[0067] The operation procedure of calculating the reduction percentage which reduces the image edit field before modification so that it may be restored to the image edit field after the image edit field before modification by the field modification procedure changing in a contraction procedure according to the image edit approach of invention of claim 6, Since it had the image contraction procedure which reduces the magnitude of two or more images, and the distance between each image with the reduction percentage which is in the condition which maintained the arrangement relation of two or more images, and was calculated with the operation procedure Like invention of claim 2, on the whole, it can reduce the whole image edit field before modification, and the image arranged to the image edit field before modification can be dedicated to the image edit field after modification.

[0068] According to the image edit approach of invention of claim 7, it sets for an operation procedure. The aspect ratio of the image edit field before modification, Based on the comparison result of the comparison procedure which compares the aspect ratio of the image edit field after modification, and a comparison procedure, the ratio of the breadth to the dip in the image edit field after modification When it increases from the ratio of the breadth to the dip in the image edit field before modification The reduction percentage which reduces the image edit field before modification so that it may become equal to the dip of the image edit field after the dip of the image edit field before modification changing is computed. When the ratio of the breadth to the dip in the image edit field after modification decreases based on the comparison result of a comparison procedure rather than the ratio of the breadth to the dip in the image edit field before modification Since it had the reduction percentage calculation procedure which computes the reduction percentage which reduces the image edit field before modification so that it might become equal to the breadth of the image edit field after the breadth of the image edit field before modification changing Like invention of claim 3, by having changed the image edit field, the image arranged to the image edit field before modification becomes small, and can prevent seeing and becoming hot.

[0069] Since [according to the image edit approach of invention of claim 8] the multiplication of the reduction percentage calculated with the operation procedure to each position coordinate of each magnitude of two or more images and two or more images concerned is carried out in an image contraction procedure Like invention of claim 4, by the easy operation, all the images arranged in the image edit field before modification can be dedicated to the image edit field after modification, where those arrangement relation is maintained.

[0070] Moreover, if the image edit processing program by invention of claim 9 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 1, and the same effectiveness as invention of claim 1 can be acquired.

[0071] Moreover, if the image edit processing program by invention of claim 10 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 2, and the same effectiveness as invention of claim 2 can be acquired.

[0072] Moreover, if the image edit processing program by invention of claim 11 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 3, and the same effectiveness as invention of claim 3 can be acquired.

[0073] Moreover, if the image edit processing program by invention of claim 12 is executed by computer, a computer can be operated as the same image edit equipment as invention of claim 4, and the same effectiveness as invention of claim 4 can be acquired.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the DTP structure of a system by the gestalt of operation of this invention.

[Drawing 2] It is the flow chart which shows the contents of processing of the flash prevention processing program by the gestalt of operation of this invention.

[Drawing 3] It is the explanatory view showing the image edit field before modification in the gestalt of operation of this invention.

[Drawing 4] It is the explanatory view showing the condition that the image overflowed the image edit field after modification in the gestalt of operation of this invention.

[Drawing 5] It is the explanatory view showing the condition of having reduced and piled up the image edit field before modification in the image edit field after modification in the gestalt of operation of this invention.

[Drawing 6] It is the explanatory view showing the condition that all images are restored to the image edit field after modification in the gestalt of operation of this invention.

[Drawing 7] It is the explanatory view showing the image edit field before modification of the gestalt of operation of this invention, and the image edit field after modification.

[Drawing 8] It is the explanatory view showing the image edit field before modification of the gestalt of operation of this invention, and the image edit field after modification.

[Description of Notations]

1 CPU

2 ROM

3 RAM

4 Display

5 Keyboard

6 Mouse

7 Hard Disk

10 DTP System

S, S1, S2 Image edit field

[Translation done.]

作業者は、ディスプレイを見ながら、画像（画像データ）をこの画像編集領域の所望の位置に貼り付ける。さらに、貼り付けた画像を重ならないように移動させたり、画像を拡大、縮小させたりして画像のレイアウトを設定する。

【0004】
 [発明が解決しようとする課題]ところで、上述したよ
 うに、ディスプレイに表示された画像編集領域が大きき
 うは、印刷する用紙のサイズに対応している。即ち、ディ
 スプレイに表示された画像編集領域の縦方向の長さが、
 印刷用紙の縦幅の寸法に対応しており、ディスプレイに
 表示された画像編集領域の横方向の長さが、印刷用紙の
 横幅の寸法に対応している。従って、表示された画像編
 集領域の大ききときにより、ディスプレイに表示された
 画像編集領域の大ききにより変更される。

【0005】この結果、画像編集領域に既に画像を貼り付けた後に、印刷用紙のサイズを変更すると、画像編集領域の大きさが変更され、貼り付けられた画像が、変更された画像編集領域からはみ出してしまいう場合がある。具体的には、画像編集領域に既に画像を貼り付けた後に、印刷用紙のサイズを以前より小さなサイズに変更したとき、または、印刷用紙の縮減寸法と増幅寸法の比（以下、これを「縮増比」という）を変更したときに、貼り付けられた画像が画像編集領域からはみ出す場合がある。

【0006】このように画像編集領域から画像がはみ出た場合には、はみ出した画像を、もう一度貼り付け直しする必要がある。画像編集作業の作業性が悪いという問題がある。特に、画像のレイアウト設定が完了した後に、印刷用紙のサイズを変更し、画像編集領域から画像がはみ出したときには、はみ出した画像を画像編集領域に再度配置するたために、レイアウト設定を全体的にやり直さなければならない場合があり、画像編集作業に多大な時間がかかってしまう。

【0007】本発明は、上述したような問題に鑑みになされたもので、画像編集領域の大きさは被写体が変更されたことにより、画像が画像編集領域からはみ出されることを防止することができ、画像編集作業の作業性を向上させることができる画像編集装置および画像編集方法を提供することを目的としている。

【0008】
 【課題を解決するための手段】上記課題を解決するため
 に、請求項1の発明は、記憶回路上に形成された画像領域
 集領域に配置された複数の画像を編集する画像編集装置
 であって、画像編集領域の幅および縦長のうちいずれ
 か一方または双方を変更することによって画像編集領域
 を変更する領域変更手段と、複数の画像のうち、領域変
 更手段によって変更後の画像編集領域からはみ出した画
 像手段による判定手段と、判定手段の判定結果に基
 いてはみ出た画像があるときには、複数の画

像の配置関係を維持した状態で、かつ、はみ出した画像が変更後の画像編集領域に納まるように、複数の画像の大ききおよび各画像間の距離を縮小する縮小手段とを備えている。

【0009】例えば、画像編集領域内に複数の画像が配置されている状態のとき、領域変更手段により、画像編集領域内の範囲および軸方向の一方または双方が小さくなるように画像編集領域を変更したとすれば、これ以後の、例えば、変更前の画像編集領域内に納まっていた画像の、1つが、変更後の画像編集領域からはみ出したとする。このような場合、判定手段は、変更後の画像編集領域からはみ出した画像があることを判定する。そして、縮小手段は、変更前の画像編集領域に配置された各画像の配置関係を維持した状態で、かつ、はみ出した画像が変更後の画像編集領域内に納まるとように、各画像の大きさおよび各画像間の距離を小さくする。

【01010】例えば、各画像の大きさと、各画像間の距離をそれぞれ同じ比率で縮小することにより、変更前の画像帰属領域に配置された画像のすべてを外側から包囲する領域を全体の外に縮小させることができる。このとき、変更前の画像帰属領域に配置された画像のすべてを外側から包囲する領域が、変更後の画像帰属領域に納まるように縮小の比率を設定すれば、変更前の画像帰属領域に配置された各画像の配置関係を維持した状態で、はみ出した画像を変更後の画像帰属領域に納めることができる。

【0011】これにより、画像編集領域の大きさが変更されたときに、画像が画像編集領域からはみ出すのを防止できるだけでなく、画像編集領域の大きさが変更されたときに、画像編集領域に配置された複数の画像の配置関係が崩れるのを防止することができる。

【0012】請求項2の発明による画像編集装置において、縮小手段は、領域変更手段による変更前の画像領域を取り除く場合、領域変更手段に与えるように変更前の画像領域を縮小する。縮小手段は、領域変更手段による変更前の画像領域を縮小する縮小率を算出する演算手段と、複数の画像の配置関係を維持した状態で、かつ、演算手段により算出された縮小率によって複数の画像の大きさをより各画像間の距離を縮小する画像縮小手段とを備えている。

【0013】即ち、変更前の画像編集領域が変更後の画像編集領域に納まるように変更前の画像編集領域を縮小する縮小率を演算により求め、この縮小率によって、複写の画像の大きさおよび各画素間の距離を縮小する。これにより、変更前の画像編集領域に配置されたすべての画素に、変更後の画像編集領域ごと全体的に縮小して、変更後の画像編集領域に納めることができる。

【0014】請求項3の発明による画像編集装置における演算手段は、変更前の画像編集領域の縦横比と、変更後の画像編集領域の縦横比とを比較する比較手段と、比較手段の比較結果に基づいて変更後の画像編集領域にお

ける総唱に対する横唱の比が、変更前の画像編集領域における総唱に対する横唱の比よりも増加したときには、変更前の画像編集領域の総唱が変更後の画像編集領域の総唱と等しくなるように変更前の画像編集領域を縮小する縮小率を算出する。比較手段の比較結果に基づいて変更後の画像編集領域に対して横唱に対する横唱の比が、変更前の画像編集領域における総唱に対する横唱の比よりも減少したときには、変更前の画像編集領域の横唱が変更後の画像編集領域の横唱と等しくなるように変更前の画像編集領域を縮小する縮小率を算出する。

段とを備えている。

【0015】即ち、画像編集領域を、その外形が比較的に特長になるように変更すると、変更後の画像編集領域における縮小に対する増殖の比が、変更前の画像編集領域における縮小に対する増殖の比よりも増加する。このように変更することには、変更前の画像編集領域の縮小が変更後の画像編集領域の縮小と等しくなるように、画像編集領域を縮小する増殖率を算出する。

[0016] 一方、画像編集領域を、その外形が比較的に長方形になるように変更すると、変更後の画像編集領域に比べて、変更前の画像編集領域に対する増減の比が、変更前の画像編集領域の幅と等しくなる。このように、変更前の画像編集領域の幅が増えたと仮定した場合、変更後の画像編集領域の幅は縮小する。同様に、変更前の画像編集領域の高さが増えたと仮定した場合、変更後の画像編集領域の高さは縮小する。したがって、変更前後の画像編集領域の面積の増減が、変更前の画像編集領域の面積と等しくなるよう、画像編集領域の縮小率を算出する。

【0017】これにより、変更前の画像編集領域内に配置されたすべての画像を、それらの配置関係を維持した状態で、変更前の画像編集領域内に配置されたすべての画像を、最小の縮小率で縮小した状態で、変更後の画像編集領域内に配置することができる。

【0018】請求項4の発明による画像編集装置における画像縮小手段は、複数の画像のそれぞれの大きさおよび当該複数の画像のそれぞれの位置座標に演算手段により演算された縮小率を乗算するものである。

【0019】これにより、簡単な演算によって、変更前の画像編集領域内に配置されたすべての画像を、それらの配置関係を維持した状態で、変更後の画像編集領域内に納めることができる。

【００２０】請求項５の発明は、記憶回路上に形成された画像領域毎に複数の被検者の画像を構築する画像の構築方法であつて、画像領域毎の枠幅および横幅のうちのいずれか一方または双方を変更することによって複数の画像のうち、領域変更手順による変更後の画像領域域からはみ出した画像があるか否かを判定する判定手順と、判定手順の結果に基づいてはみ出した画像があるときに、被検者の画像の大きさをおよび各画像間の距離を縮小する縮

編集領域に納まるように、前記複数の画像の大きさをおよび各画像間の距離を縮小手順とを備えた画像編集処理プログラムを記録した記録媒体。

【補求項10】 前記縮小手順は、更に前記短辺を更に縮小するよう変更前の画像領域が前記変更後の画像領域内に納まるように前記変更前の画像領域の縮小率を減算する縮小率を減算して決定され、前記前記短辺の画像の配置関係を維持した状態で、かつ、前記縮小手順により演算された縮小率によって前記複製数の画像の大きさおよび各画像間の距離を縮小する画像縮小手順とを備えている請求項9に記載の画像編集処理プログラムを記載している請求項10に記載の媒体。

[illegible]

ムを記録した記録媒体。
を備えている請求項10に記載の画像隔集処理プログラ

【請求項12】 前記画像縮小手順は、前記複数の画像のそれぞれの大きさおよび当該複数の画像のそれぞれの位置座標に前記演算手順により演算された縮小率を乗算するものである請求項10または11に記載の画像編集装置。

[0001]

【発明の属する技術分野】本発明は、例えば、DTPシステム、プリンタシステム、ワードプロセッサ等に用いられ、コンピュータ上で画像の編集を行うための画像編集装置および画像編集方法に関する。

【0002】
【従来の技術】 カタログ、チラシ、雑誌、新聞等の印刷物を作成するとき、用紙上に配置する複数の画像のレイアウトを決定する必要がある。このような作業は、通常、パソコンやワークステーション等のコンピュータを使用したDTPシステム等を用いて行われる。

【0003】例えば、印刷する用紙のサイズに対応した画像編集領域を、コンピュータの記憶回路上に設定し、この画像編集領域をディスプレイに表示する。そして、

小手順とを備えている。

【0021】これにより、請求項1の発明と同様に、画像編集領域の大きさが変更されたときに、画像が画像編集領域からはみ出すのを防止できると共に、画像編集領域の大きさが変更されたときに、画像編集領域に配置された複数の画像の配置関係が崩れるのを防止することができる。

【0022】請求項6の発明による画像編集方法における縮小手順は、領域変更手順による変更前の画像編集領域が変更後の画像編集領域に納まるように変更前の画像編集領域を縮小する縮小率を演算する演算手順と、複数の画像の配置関係を維持した状態で、かつ、演算手順により演算された縮小率によって複数の画像の大きさおよび各画像間の距離を縮小する画像縮小手順とを備えている。

【0023】これにより、請求項2の発明と同様に、変更前の画像編集領域に配置された画像を、変更前の画像編集領域ごと全体的に縮小して、変更後の画像編集領域に納めることができる。

【0024】請求項7の発明の画像編集方法における演算手順は、変更前の画像編集領域の縦横比と、変更後の画像編集領域の縦横比とを比較する比較手順と、比較手順の比較結果に基づいて変更後の画像編集領域における縦横に対する縦横の比が、変更前の画像編集領域における縦横に対する縦横の比よりも増加したときに、変更前の画像編集領域の縦横が変更後の画像編集領域の縦横と等しくなるように変更前の画像編集領域を縮小する縮小率を算出し、比較手順の比較結果に基づいて変更後の画像編集領域における縦横に対する縦横の比が、変更前の画像編集領域の縦横の比よりも減少したときには、変更前の画像編集領域の縦横が変更後の画像編集領域の縦横と等しくなるように変更前の画像編集領域を縮小する縮小率を算出する縮小率を算出する縮小率算出手順とを備えている。

【0025】これにより、請求項3の発明と同様に、変更前の画像編集領域内に配置されたすべての画像を、最も縮小率で縮小した状態で、変更後の画像編集領域に納めることができる。

【0026】請求項8の発明による画像編集方法における画像縮小手順は、複数の画像のそれぞれの大きさおよび当該複数の画像のそれぞれの位置座標に演算手順により演算された縮小率を算するものである。

【0027】これにより、請求項4の発明と同様に、簡単な演算によって、変更前の画像編集領域内に配置されたすべての画像を、それらの配置関係を維持した状態で、変更後の画像編集領域に納めることができる。

【0028】また、請求項9の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項1の発明と同様の画像編集装置として機能させることができる。

【0029】また、請求項10の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項2の発明と同様の画像編集装置として機能させることができる。

【0030】また、請求項11の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項3の発明と同様の画像編集装置として機能させることができる。

【0031】また、請求項12の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項4の発明と同様の画像編集装置として機能させることができる。

【0032】
【発明の実施の形態】以下、本発明の実施の形態を添付図面に就いて説明する。

【0033】本実施形態では、本発明による画像編集装置および画像編集方法を適用した装置としてDTPシステムを例に挙げて説明する。

【0034】図1は、本実施形態によるDTPシステム10の全体構成を示している。図1に示すように、DTPシステム10は、CPU11、ROM12、RAM13、ディスプレイ14、キーボード15、マウス16、ハードディスク17およびプリンタ18等を備えている。

【0035】CPU11は、DTPシステム10全体の制御を行うものである。また、CPU11は、後述するように、図2に示す画像編集処理プログラムを実行する。

【0036】ROM12には、DTPシステム10全体を制御するためのプログラム、図2に示す画像編集処理プログラム、その他、各種データ等が記憶されている。RAM13は、CPU11が画像編集処理等を行うときに作業領域として使用される。さらに、RAM13には、後述の画像編集領域Sが形成される。

【0037】ディスプレイ14は、CRTディスプレイまたは液晶ディスプレイ等から構成されている。このディスプレイ14には、画像編集領域Sが表示される。また、ハードディスク17には、画像編集に用いる画像データが記憶されている。さらに、プリンタ18は、画像編集領域Sを、当該画像編集領域Sに配置された画像と共に、印刷用紙上に印刷するものである。即ち、プリンタ18は、画像編集領域Sに配置された各画像を、互いの配置関係を維持したまま印刷する。

【0038】ここで、DTPシステム10のRAM13に形成される画像編集領域Sについて説明する。画像編集領域Sは、図3に示すように、画像の編集を行うための領域であり、この画像編集領域Sは、X-Y座標平面であり、図3中において、画像編集領域Sの左上頂点が原点(0, 0)であり、図3中の右側に行くほど、画像編集領域SのX座標値が増加し、図3中の下側に行くほど

ど、画像編集領域SのY座標値が増加する。また、画像編集領域Sの大きさは、印刷用紙のサイズに対応するように設定されている。従って、印刷用紙のサイズを変更すると、これに連動して、画像編集領域Sの大きさが変更される。

【0039】この画像編集領域Sにおいて画像編集処理を行うとき、CPU11は、画像編集領域Sに配置された画像の対角線上に向かい合う2点の座標を少なくとも認識しており、これに基づいて、CPU11は、必要に応じて、画像の位置、大きさ、各辺の位置や長さ等を演算によって求めることができる。

【0040】また、画像編集領域Sに配置された画像は、その外形が矩形である。カタログ、チラシ、雑誌、新聞等の印刷物を作成するとき、印刷用紙上に配置する画像の外形は通常、矩形であるため、本実施形態によるDTPシステム10においては、外形が矩形の画像を編集することを前提としている。なお、本実施形態によるDTPシステム10において、矩形以外の形状を有する画像を編集することも可能である。この場合には、その画像を囲む矩形の枠を想定し、この矩形の枠と画像とを一体化させて取り扱う。これにより、矩形以外の形状を有する画像であっても、矩形画像と同様に編集することができる。

【0041】このように構成されたDTPシステム10によって画像編集を行うとき、作業者は、印刷用紙のサイズを設定することにより、画像編集を行う画像編集領域Sの大きさを設定する。そして、作業者は、ハードディスク17に記憶された画像データを呼び出し、この画像データを、キーボード15およびマウス16を操作して、ディスプレイ14に表示された画像編集領域Sに貼り付ける。さらに、作業者は、マウス16を操作することにより、画像編集領域Sに貼り付けた画像(画像データ)を移動させることができる。また、キーボード15を用いて画像編集領域S中の座標を入力することによっても、画像を移動させることができる。また、ディスプレイ14に表示された画像編集領域Sの大きさは、印刷用紙のサイズに対応するように設定されているため、作業者は、用紙上に実際の絵や写真を貼り付けるのと同様の感覚で、画像のレイアウト設定等の画像編集作業を行うことができる。そして、プリンタ18によって、ディスプレイ14に表示された各画像をそのまま印刷用紙上に印刷することができる。

【0042】次に、図2に示す画像編集処理プログラムについて説明する。この画像編集処理プログラムは、画像編集領域Sの大きさが変更され、変更後の画像編集領域Sから画像がはみ出したときに、そのはみ出した画像を、変更後の画像編集領域S内に納めるはみ出す防止処理を行うものである。

【0043】DTPシステム10に電源が投入されると、図2に示すプログラムが起動される。まず、ステッ

プ21では、画像編集領域Sが変更されたか否かを判定する。即ち、画像編集領域Sは印刷用紙のサイズを変更することによって変更される。具体的に説明すると、作業者は、キーボード15を操作することによって印刷用紙のサイズを変更することができる。例えば、作業者は、A1、A4、B4等の規格化された印刷用紙サイズを選択することにより、または、印刷用紙の縦横寸法および横割寸法を入力することにより印刷用紙のサイズを変更することができる。そして、ステップ21の判定の結果、印刷用紙のサイズが変更されたことにより画像編集領域Sが変更されたときには、ステップ22に移行する。

【0044】ステップ22では、変更後の画像編集領域Sにはみ出した画像があるかを判定する。例えば、図3に示すように、変更前の画像編集領域S1に、既に画像Aおよび画像Bが配置されているときに、画像編集領域S1が、画像編集領域S2のように変更されたときには、図4に示すように、画像Bが変更後の画像編集領域S2からはみ出してしまふ場合がある。このような場合は、このステップ22で「YES」と判定され、ステップ23に移行する。一方、変更後の画像編集領域S2からはみ出した画像がないときには、ステップ21に戻る。

【0045】ここで、変更後の画像編集領域S2にはみ出した画像があるか否かは、変更後の画像編集領域S2の大きさと、変更前の画像編集領域S1内にある各画像の位置とを比較することによって演算により判定することができる。また、変更後の画像編集領域S2の大きさは、変更後の画像編集領域S2の頂点の座標を調べることによって認識することができる。変更前の画像編集領域S1内にある各画像の位置は、各画像の頂点の座標を調べることによって認識することができる。

【0046】さて、ステップ23では、変更後の画像編集領域S2の縦横比が変更前の画像編集領域S1の縦横比よりも大きくなったか否かを判定する。ここで、画像編集領域Sの縦横比とは、画像編集領域Sの縦横に対する横割寸法を意味する。即ち、画像編集領域Sの縦横比は、横割/縦割である。従って、図7に示すように、画像編集領域Sの外形が比較的に横長に変化すると、画像編集領域Sの縦横比が大きくなる。一方、図8に示すように、画像編集領域Sの外形が比較的に縦長に変化すると、画像編集領域Sの縦横比が小さくなる。

【0047】そして、ステップ23の判定結果に基づいて、変更後の画像編集領域S2の縦横比が変更前の画像編集領域S1の縦横比よりも大きくなったときにはステップ24に移行する。

【0048】ステップ24では、図7に示すように、変更前の画像編集領域S1が変更後の画像編集領域S2に納まるように、変更前の画像編集領域S1を縮小させるための縮小率を演算により求める。具体的には、変更後

15
幅が変更後の画像編集領域の横幅と等しくなるように変更前の画像編集領域を縮小する縮小率を算出する縮小率算出手順とを備えたから、請求項3の発明と同様に、画像編集領域が変更されたことによって、変更前の画像編集領域に配置された画像が小さくなり、見辛くなるのを防止することができる。

【0069】請求項8の発明の画像編集方法によれば、画像縮小手順において、複数の画像のそれぞれの大きさおよび当該複数の画像のそれぞれの位置座標に換算手順により演算された縮小率を算算することとしたから、請求項4の発明と同様に、簡単な演算によって、変更前の画像編集領域内に配置されたすべての画像を、それらの配置関係を維持した状態で、変更後の画像編集領域に納めることができる。

【0070】また、請求項9の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項1の発明と同様の画像編集装置として機能させることができ、請求項1の発明と同様の効果を得ることができる。

【0071】また、請求項10の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項2の発明と同様の画像編集装置として機能させることができ、請求項2の発明と同様の効果を得ることができる。

【0072】また、請求項11の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項3の発明と同様の画像編集装置として機能させることができ、請求項3の発明と同様の効果を得ることができる。

【0073】また、請求項12の発明による画像編集処理プログラムをコンピュータによって実行すれば、コンピュータを請求項4の発明と同様の画像編集装置として

機能させることができ、請求項4の発明と同様の効果を得ることができる。

【図面の簡単な説明】

【図1】本発明の実施の形態によるDTPシステムの構成を示すブロック図である。

【図2】本発明の実施の形態によるはみ出し防止処理プログラムの処理内容を示すフローチャートである。

【図3】本発明の実施の形態において変更前の画像編集領域を示す説明図である。

【図4】本発明の実施の形態において変更後の画像編集領域から画像のはみ出しした状態を示す説明図である。

【図5】本発明の実施の形態において変更後の画像編集領域内に、変更前の画像編集領域を縮小して重ね合わせた状態を示す説明図である。

【図6】本発明の実施の形態において変更後の画像編集領域にすべての画像が納まっている状態を示す説明図である。

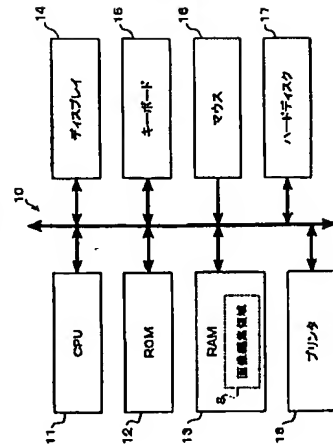
【図7】本発明の実施の形態の変更前の画像編集領域と変更後の画像編集領域を示す説明図である。

【図8】本発明の実施の形態の変更前の画像編集領域と変更後の画像編集領域を示す説明図である。

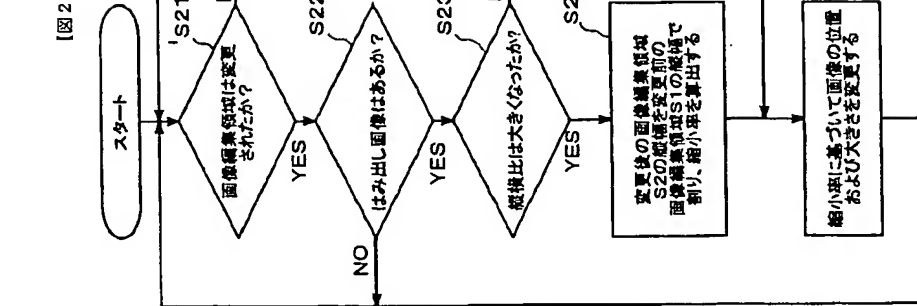
【符号の説明】

- 1 CPU
- 2 ROM
- 3 RAM
- 4 ディスプレイ
- 5 キーボード
- 6 マウス
- 7 ハードディスク
- 10 DTPシステム
- S, S1, S2 画像編集領域

【図1】



【図2】



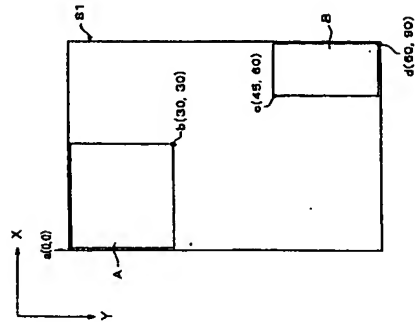
(11)

特開平11-219440

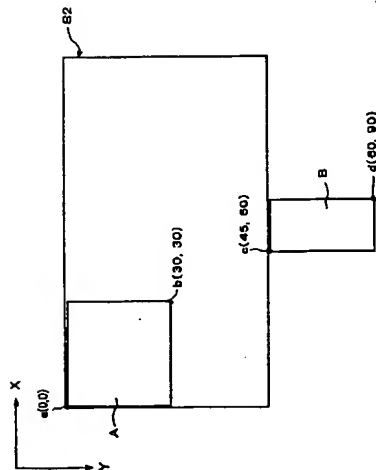
(12)

特開平11-219440

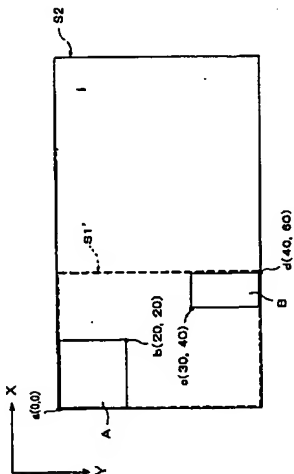
【図3】



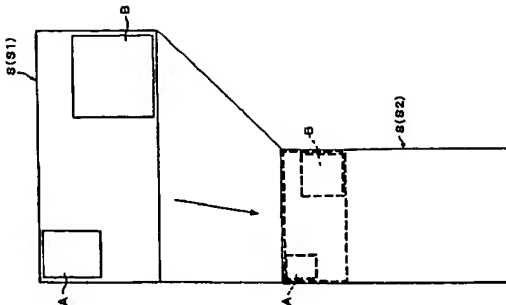
【図4】



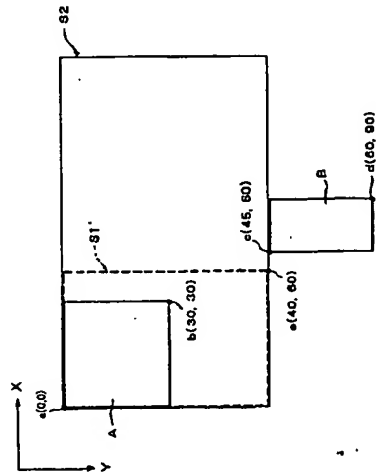
【図6】



【図8】



【図5】



【図7】

